

One of the principal investigators Leonard J. Pietrafesa (LJP) of this project was a co-principal investigator (along with J. Miller of North Carolina State University) of a concurrent National Oceanographic and Atmospheric Administration - University of North Carolina Sea Grant College Program grant (NOAA/Sea Grant) funded project entitled "Abiotic Factors Affecting Inlet Migration". The results of the Sea Grant project showed the following:

1. Under the action of northeasterly to northwesterly (southwestward to southeastward winds, sea level rises on the ocean side of Oregon Inlet while dropping on the Pamlico Sound side; this rise in sea level outside coupled with the drop inside the inlet creates a hydraulic head which enhances inflow on the flood stage of the tide and weakens or negates outflow on the ebb.
2. Southerly (northward) quadrant winds have the opposite effect.
3. Winds which blow from the quadrant lying between northwest to northeast directions (the Northerly quadrant) enhance recruitment of juvenile finfish into Pamlico Sound.

The primary hypothesis to be tested by this EPA/APES project is as follows:

During periods of enhanced recruitment (northerly or southward quadrant winds), water flow within Croatan Sound would be to the south at all depths and there would be no flow into Albemarle Sound from the Pamlico. This "southerly flow at all depths" hypothesis follows from the conjecture that the upwind force due to water surface slope would be weakened in Croatan due to the obstacle to north-south flow posed by the presence of Roanoke Island. This hypothesized southerly flow would prevent fish larvae from entering Albemarle Sound and thus enhance the productivity of Pamlico Sound at the expense of Albemarle Sound.